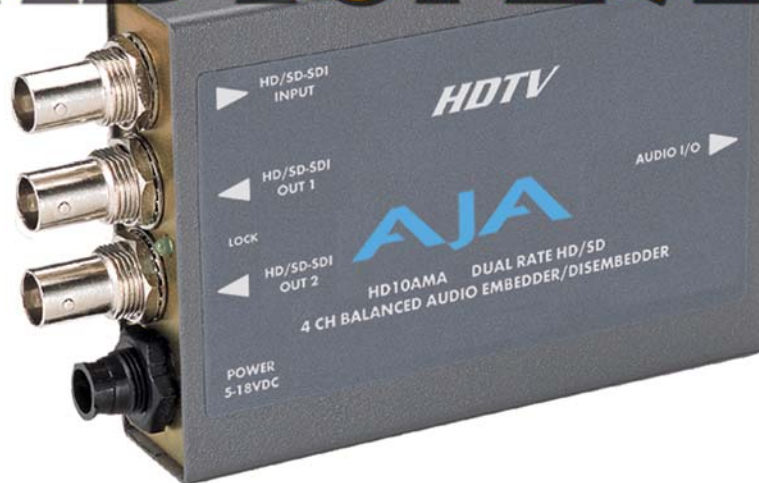# HD10AMA
HD/SD 4-Channel Analog
Embedder/Disembedder
User Manual

AJA
VIDEO SYSTEMS

September 25, 2008   P/N 101659-01

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443 Crown Point Circle, Grass Valley, CA. 95945 USA

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Fax: +1.530.274.9442

Web: http://www.aja.com
Support Email: support@aja.com
Sales Email: sales@aja.com

When calling for support, have all information on the product (serial number etc.) at hand prior to calling.

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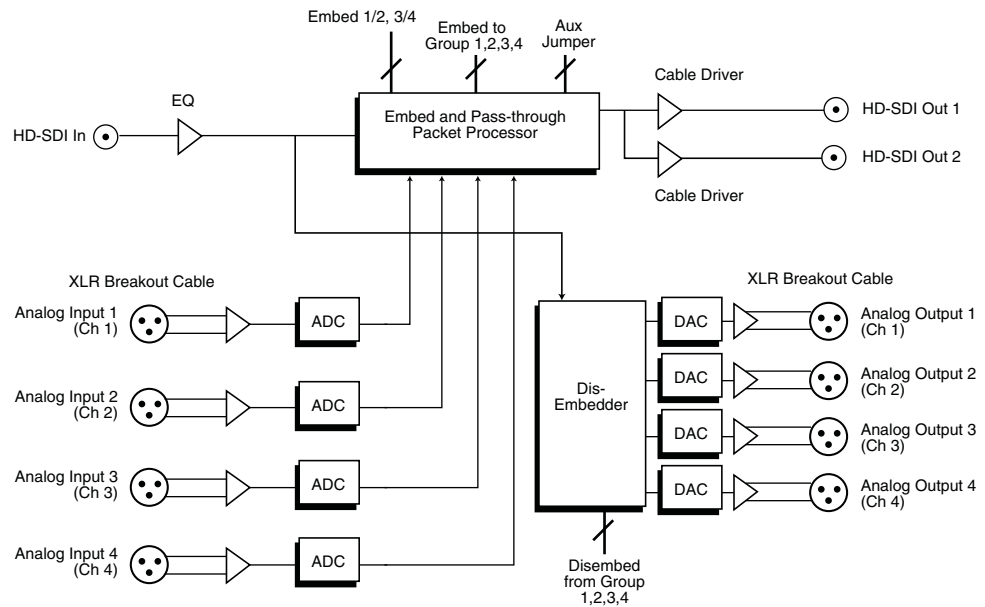
Introduction

The HD10AMA is a dual rate 4 channel analog audio Embedder/Disembedder. The Disembedder is always functional providing 4 outputs. The Embedder is user selectable, on a channel pair basis, to either "pass" input audio or embed input audio from the breakout cable. Analog audio levels are selectable. The HD10AMA automatically detects and configures to the input video standard.

Features

- Dual rate HD-SDI/SDI Embedder/Disembedder
- 4 Channel Balanced Analog Audio I/O
- Supplied XLR breakout cable
- HD-SDI/SDI input, 2 HD-SDI/SDI outputs
- Dipswitch configuration
- 5-18VDC Power

Block Diagram

HD10AMA, Block Diagram

I/O Connections

HD/SD-SDI Input
BNC

HD/SD-SDI
Output 1
BNC

HD/SD-SDI
Output 2
BNC

+ 5 to 18VDC
Power
Input

Analog I/O
D-connector
(attaches to
supplied cable)

Configuration
Determined by
DIP switch on
other side of
Converter

Cable
Not Shown
To Scale
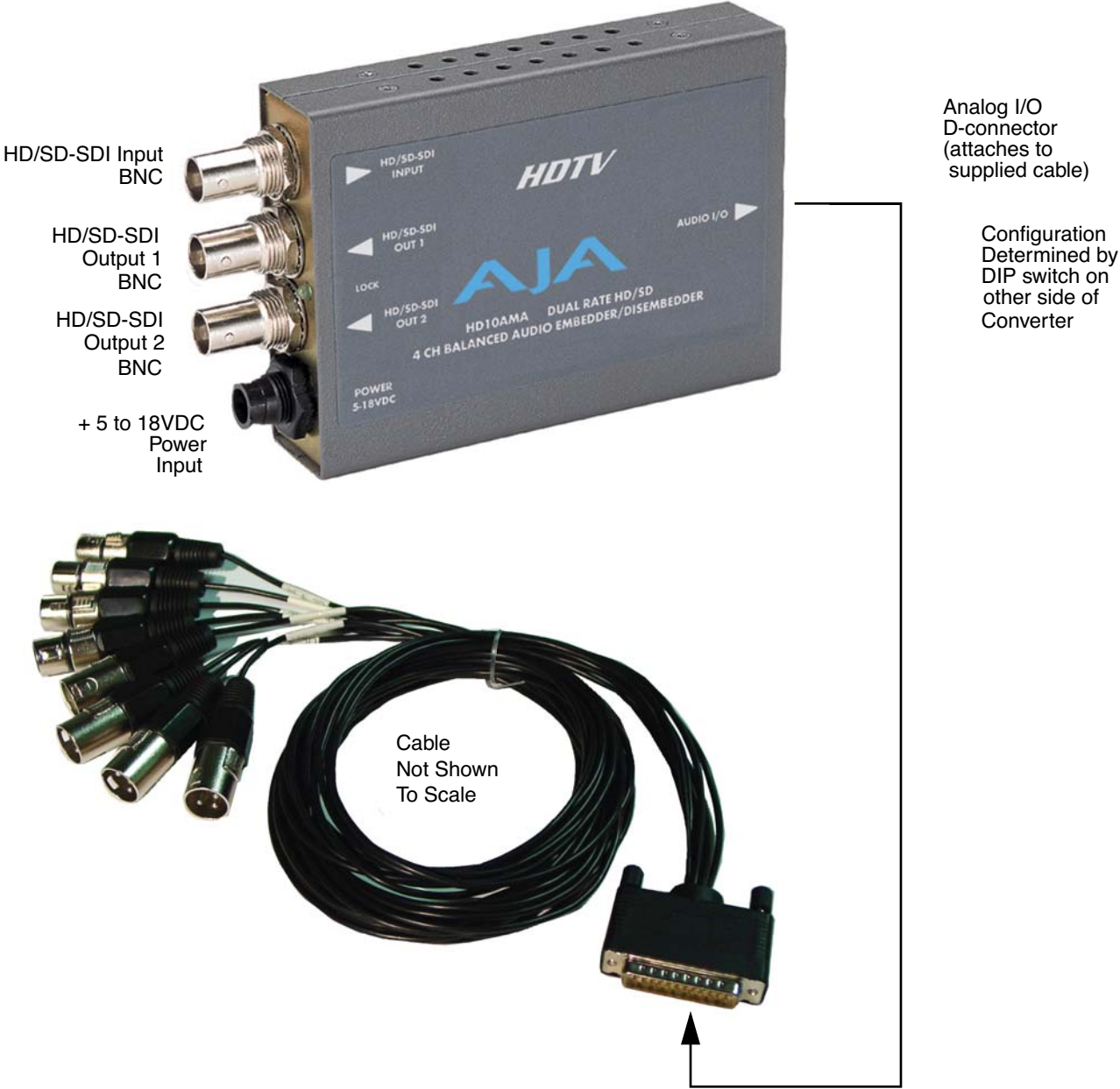
HD10AMA and Cable, Side View

User Controls

```
DIP Switch Setting
LEFT      RIGHT

1    ON    EMBD 1/2      OFF
2    ON    EMBD 3/4      OFF
3    0     EMBD GRP L     1
4    0     EMBD GRP H     1
5    0     DISEMBD GRP L  1
6    0     DISEMBD GRP H  1
7    PRO   LEVEL        CSMR
8    H     LEVEL          L

MODEL  HD10AMA

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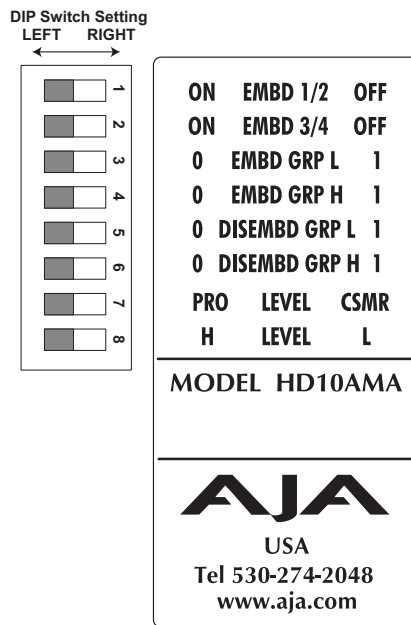
The user interface for the HD10AMA is an 8-switch DIP accessible through a cut-out in the bottom of the unit. Use the DIP switches to configure how the Analog embedding and disembedding functions. There is also a jumper on the internal circuit board, accessible by removing the outer shell case of the HD10AMA. Located by the DIP switch, this jumper is used in conjunction with the DIP switches 1 and 2 to select certain functions—see the discussion later on this page.

Note: The combination of the AUX jumper setting and the DIP switch settings determines the overall operation of the HD10AMA.

The exact function of each DIP switch and what it controls is described on the following pages.

DIP Switch Settings

AUX Jumper (inside case)—pass or delete ancillary data packets

The function of the AUX jumper is to delete all incoming ancillary data packets in both the horizontal and vertical ancillary data spaces. In the default postion (OPEN), ancillary data packets are preserved and passed through whenever possible (i.e., when audio packets for that group are not being embedded).

To remove the case shell, simply remove the four phillips screws that fasten the back half of the case shell (the half having the DIP switch access hole).

```
Place AUX Jumper
Here to CLOSE
(Factory Default is OPEN)
```
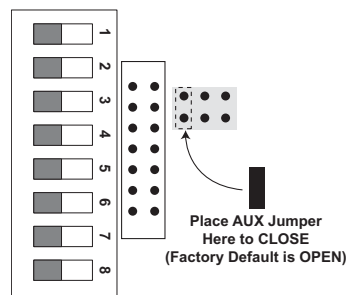
AUX Jumper (Accessed On Circuit Board Inside The HD10AMA Case)

Switch 1 (EMBD 1/2)—Controls Audio Embedding for Channels 1/2

LEFT	RIGHT
Overwrite or embed new channel 1/2 packets	If AUX Jumper is OPEN: Pass any channel 1/2 packets on input SDI.
	If AUX Jumper is CLOSED: Delete all packets from input SDI.

Switch 2 (EMBD 3/4)—Controls Audio Embedding for Channels 3/4

LEFT	RIGHT
Overwrite or embed new channel 3/4 packets	If AUX Jumper is OPEN: Pass any channel 3/4 packets on input SDI.

If AUX Jumper is CLOSED: Delete all packets from input SDI. |

Switches 3 and 4 (EMBD GRP L) and (EMBD GRP H)— Channel Mapping For Embedded Groups

The following tables show how combinations of setting these two switches affects channel mapping.

Switch 3: EMBD GRP L Left (0), Switch 4: EMBD GRP H Left (0)

Audio Input Channel	SDI Embedded Output Group	SDI Embedded Output Channel
1 —>	1	1
2 —>	1	2
3 —>	1	3
4 —>	1	4

Switch 3: EMBD GRP L Right (1), Switch 4: EMBD GRP H Left (0)

Audio Input Channel	SDI Embedded Output Group	SDI Embedded Output Channel
1 —>	2	5
2 —>	2	6
3 —>	2	7
4 —>	2	8

Switch 3: EMBD GRP L Left (0), Switch 4: EMBD GRP H RIght (1)

Audio Input Channel	SDI Embedded Output Group	SDI Embedded Output Channel
1 —>	3	9
2 —>	3	10
3 —>	3	11
4 —>	3	12

Switch 3: EMBD GRP L Right (1), Switch 4: EMBD GRP H Right (1)

Audio Input Channel	SDI Embedded Output Group	SDI Embedded Output Channel
1 —>	4	13
2 —>	4	14
3 —>	4	15
4 —>	4	16

Switches 5 and 6 (DISEMBD GRP L) and (DISEMBD GRP H)— Channel Mapping For Disembedding Groups

The following tables show how combinations of setting these two switches affects channel mapping.

Switch 5: DISEMBD GRP L Left (0), Switch 6: DISEMBD GRP H Left (0)

SDI Embedded Input Group	SDI Embedded Input Channel	Audio Output Channel
1	1 —>	1
1	2 —>	2
1	3 —>	3
1	4 —>	4

Switch 5: DISEMBD GRP L Right (1), Switch 6: DISEMBD GRP H Left (0)

SDI Embedded Input Group	SDI Embedded Input Channel	Audio Output Channel
2	5 —>	1
2	6 —>	2
2	7 —>	3
2	8 —>	4

Switch 5: DISEMBD GRP L Left (0), Switch 6: DISEMBD GRP H RIght (1)

SDI Embedded Input Group	SDI Embedded Input Channel	Audio Output Channel
3	9 —>	1
3	10 —>	2
3	11 —>	3
3	12 —>	4

Switch 5: DISEMBD GRP L Right (1), Switch 6: DISEMBD GRP H Right (1)

SDI Embedded Input Group	SDI Embedded Input Channel	Audio Output Channel
4	13 —>	1
4	14 —>	2
4	15 —>	3
4	16 —>	4

Switch 7 (LEVEL)—Control Whether Audio Levels are Professional Or Consumer. Affects all 4 Inputs and Outputs

LEFT	RIGHT
Professional Levels (See I/O Level Selection Matrix Table)	Consumer Levels (See I/O Level Selection Matrix Table)

Note: Professional audio equipment has much higher levels than consumer equipment: a 0 VU reading corresponds to +4 dBu. Connecting a professional +4 dBu device to a consumer audio input (-7 to -8 dBu) may produce dangerous overloading, whereas the output of a consumer device probably does not have sufficient power to drive a professional audio input. With consumer and semi-professional audio equipment, a VU reading of 0 dB is typically referenced to -10 dBV, which is equivalent to -7.78 dBu.

Switch 8 (LEVEL)—Control Whether Audio Levels are High or Low. Affects all 4 Inputs and Outputs

LEFT	RIGHT
High Levels (See I/O Level Selection Matrix Table)	Low Levels (See I/O Level Selection Matrix Table)

Output Level Selection Matrix For Switches 7 and 8

The following table shows the combinations of DIP switch settings required to configure the audio output levels shown.

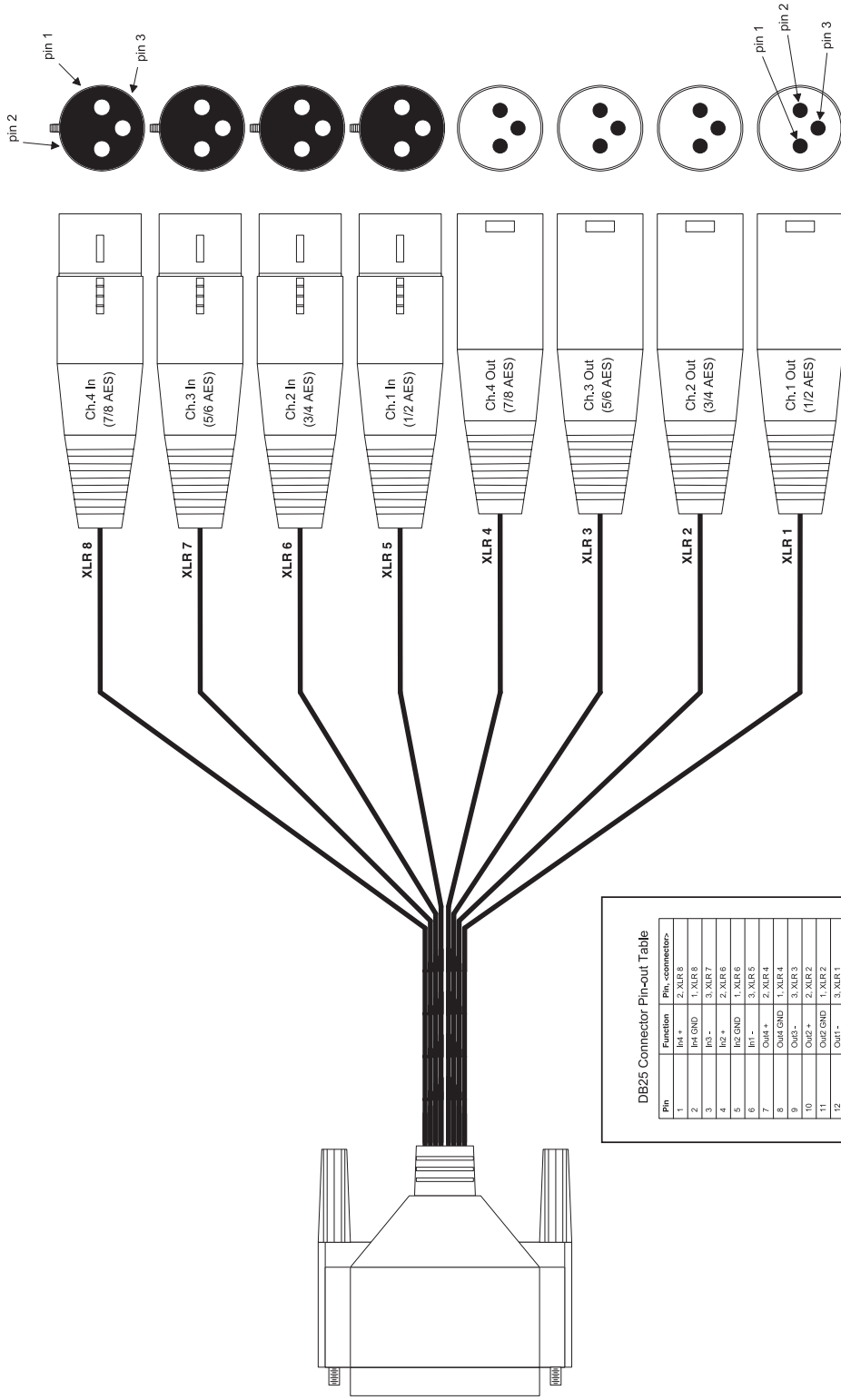| In/Out Level Range	Nominal (-20dBFS)	Full Scale (0dBFS)	DIP Switch #7	DIP Switch #8
Professional High (US)	+4dBu	+24dBu	LEFT	LEFT
Professional Low (European)	-2dBu	+18dBu	LEFT	RIGHT
Consumer High	-8dBu	+12dBu	RIGHT	LEFT
Consumer Low	-14dBu	+6dBu	RIGHT	RIGHT

Installation

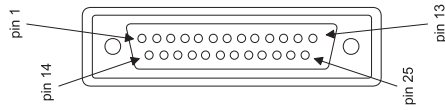Typically, HD10AMA installation consists of the following:

1. disconnect +5VDC from the converter
2. configure the DIP switch for the desired equipment configuration and video formats
3. connect video equipment to the converter BNCs
4. apply +5-18VDC power to the converter (AJA power supply model DWP)

Specifications

Item	Specification
Formats	HD SMPTE 292/296M SD SMPTE 259M (Automatic Configuration)
Video Input	HD-SDI or SDI BNC
Video Outputs	HD-SDI or SDI, 2x BNC
Audio Inputs	4 x Balanced Analog Audio, XLR
Audio Outputs	4 x Balanced Analog Audio, XLR
Audio Levels (Full Scale Digital)	See *Output Level Selection Matrix* presented earlier
Audio Converters	24 bit
Embedded Audio	SMPTE 272M (SD): 20-bit, 48KHz synchronous SMPTE 299M (HD): 24 bit, 48KHz synchronous
Video Processing Delay	HD Mode: 7μS SD Mode: 19μS
Audio Processing Delay	Disembed Delay: 920 uS Embed Delay: 1200uS
User Controls	External Dipswitch: Embedder on/off, Ch pairs 1/2 - 3/4 Input group select, 1-4 Output Group Select, 1-4 Audio Level: Pro/Consumer, High/Low
Size	5.8" x 3.1" x 1 (147 x 79 x 25mm)
Power	5-18V, 5 watts. Requires power supply.

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End View:

4 Channel Audio I/O Breakout Cable

pin 1, pin 2, pin 3

Ch.4 In (7/8 AES) — XLR 8
Ch.3 In (5/6 AES) — XLR 7
Ch.2 In (3/4 AES) — XLR 6
Ch.1 In (1/2 AES) — XLR 5
Ch.4 Out (7/8 AES) — XLR 4
Ch.3 Out (5/6 AES) — XLR 3
Ch.2 Out (3/4 AES) — XLR 2
Ch.1 Out (1/2 AES) — XLR 1

pin 1, pin 13, pin 14, pin 25

DB25 Connector Pin-out Table

Pin	Function	Pin.<connector>
1	In4 +	2, XLR 8
2	In4 GND	1, XLR 8
3	In3 -	3, XLR 7
4	In2 +	2, XLR 6
5	In2 GND	1, XLR 6
6	In1 -	3, XLR 5
7	Out4 +	2, XLR 4
8	Out4 GND	1, XLR 4
9	Out3 -	3, XLR 3
10	Out2 +	2, XLR 2
11	Out2 GND	1, XLR 2
12	Out1 -	3, XLR 1
13	NC	NC
14	In4 -	3, XLR 8
15	In3 +	2, XLR 7
16	In3 GND	1, XLR 7
17	In2 -	3, XLR 6
18	In1 +	2, XLR 5
19	In1 GND	1, XLR 5
20	Out4 -	3, XLR 4
21	Out3 +	2, XLR 3
22	Out3 GND	1, XLR 3
23	Out2 -	3, XLR 2
24	Out1 +	2, XLR 1
25	Out1 GND	1, XLR 1